Phenomenology 2025 Symposium



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A Hybrid Type I + III Inverse Seesaw Mechanism in $U(1)_{R-L}$ -symmetric MSSM

Tuesday 20 May 2025 18:00 (15 minutes)

We show that, in a $U(1)_{R-L}$ -symmetric supersymmetric model, the pseudo-Dirac bino and wino can give rise to three light neutrino masses through effective operators, generated at the messenger scale between a SUSY breaking hidden sector and the visible sector. The neutrino-bino/wino mixing follows a hybrid type I+III inverse seesaw pattern. The light neutrino masses are governed by the ratio of the $U(1)_{R-L}$ -breaking gravitino mass, $m_{3/2}$, and the messenger scale Λ_M . The charged component of the $SU(2)_L$ -triplet, here the lightest charginos, mix with the charged leptons and generate flavor-changing neutral currents at tree level. We find that resulting lepton flavor violating observables yield a lower bound on the messenger scale, Λ_M gtrsim(500 - 1000) TeV for a simplified hybrid mixing scenario. We identify interesting mixing structures for certain $U(1)_{R-L}$ -breaking singlino/tripletino Majorana masses. For example, in some parameter regimes, bino or wino has no mixing with the electron neutrino. We also describe the rich collider phenomenology expected in this neutrino-mass generation mechanism.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

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